

**In the Claims:**

Please add the following claims:

501b  
17  
--Claim 40. (NEW) A method of monitoring polymer array synthesis on a solid substrate comprising:

(i) synthesizing a preselected array of diverse polymers connected to cleavable linkers on a solid substrate, whereby the diverse polymers occupy different regions of the solid substrate;

(ii) cleaving diverse polymers from the solid substrate by cleaving the cleavable linkers, thereby creating a mixture of diverse unbound polymers; and

H29  
(iii) measuring presence of diverse unbound polymers as an indicator of the efficiency of the synthesizing step.

Claim 41. (NEW) The method of claim 40, wherein each of the polymers further comprises a label.

Claim 42. (NEW) The method of claim 41, wherein the labeled polymers comprise a label comprising a fluorescent moiety.

Claim 43. (NEW) The method of claim 41, wherein each of the labeled polymers comprises a single isomeric label.

Claim 44. (NEW) The method of claim 41, wherein the labeled unbound polymers are heterogeneous by number of monomeric units, and wherein the method further comprises separating the labeled unbound polymers by number of monomeric units.

Claim 45. (NEW) The method of claim 41, wherein the labeled unbound polymers are heterogeneous by number of monomeric units, and wherein the method further comprises separating the labeled unbound polymers by charge using ion exchange chromatography.

Claim 46. (NEW) The method of claim 41, wherein each of the labeled unbound polymers is heterogeneous by number of monomeric units, and wherein the method further comprises separating the labeled unbound polymers by number of monomeric units using capillary gel electrophoresis.

Claim 47. (NEW) The method of claim 45, wherein the ion exchange chromatography is performed by HPLC.

Claim 48. (NEW) The method of claim 45, wherein the ion exchange chromatography is performed by HPLC, and wherein the labeled unbound polymers are detected as they exit an ion exchange column.

Claim 49. (NEW) The method of claim 40, wherein the polymer is an oligonucleotide.

Claim 50. (NEW) A method for measuring the effect of altering a polymer array synthesis protocol, comprising:

(i) synthesizing a preselected array of diverse polymers occupying different regions on a solid support by a first synthesis protocol, thereby creating a reference array of polymers;

(ii) synthesizing a preselected array of diverse polymers occupying different regions on a solid support synthesized by a second synthesis protocol, wherein the second synthesis protocol is different than the first synthesis protocol, thereby creating a test array of polymers;

(iii) cleaving separately the reference array of polymers and the test array of polymers, thereby creating a mixture of diverse cleaved polymers from the reference array and a mixture of diverse cleaved polymers from the test array;

(iv) measuring presence of diverse cleaved polymers from the test array as an indicator of the efficiency of the first synthesis procedure and measuring presence of the mixture of diverse cleaved polymers from the reference array as an indicator of the efficiency of the second synthesis procedure, thereby determining whether a difference between the first and second synthesis procedures affects the efficiency of the second synthesis procedure.

Claim 51. (NEW) The method of claim 50, wherein the test and reference polymers are oligonucleotides.

Claim 52. (NEW) The method of claim 50, wherein the first synthesis protocol differs from

H29  
cont

the second synthesis protocol by a single variation.

Claim 53. (NEW) The method of claim 50, wherein the reference polymers and the test polymers are attached to the solid substrate by a cleavable linker.

Claim 54. (NEW) The method of claim 50, wherein the test and reference polymers comprise a detectable label.

Claim 55. (NEW) The method of claim 54, wherein the label is a single isomeric label.

Claim 56. (NEW) The method of claim 54, wherein the detectable label comprises a fluorescent moiety.--